



NIOSH
Fire Fighter Fatality Investigation
and Prevention Program

Death in the line of duty...

A Summary of a NIOSH fire fighter fatality investigation

October 24, 2001

Motor-Vehicle Incident Claims the Life of a Volunteer Assistant Chief - Alaska

SUMMARY

On March 6, 2001, a 41-year-old male volunteer Assistant Chief (the victim) died after the engine he was driving left the road, overturned, and struck a tree. The victim (driver) and a fire fighter had responded in Engine 5 at 1445 hours to a structure fire. At 1503 hours, the victim lost control of the engine on an icy, snow-packed gravel road. The engine left the road, overturned onto the passenger's side, and struck a tree. The victim was thrown into the passenger's side, landing on top of the fire fighter. The victim was entrapped and had to be extricated from the vehicle. Emergency Medical Technicians performed cardiopulmonary resuscitation (CPR) on the victim for approximately 20 minutes before pronouncing him dead at 1530 hours at the scene. The fire fighter (passenger) was able to climb out of the cab and was provided medical attention to ensure that he had not sustained any serious injuries. NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- *ensure that all drivers of fire department vehicles are responsible for the safe and prudent operation of the vehicle under all conditions*
- *ensure that apparatus equipped with water tanks are provided with baffles to control the water's movement*
- *enforce standard operating procedures (SOPs) on the use of seat belts in all emergency vehicles*

INTRODUCTION

On March 6, 2001, a 41-year-old male volunteer Assistant Chief (the victim) died after the engine he was driving left the road, overturned, and struck a tree. The National Institute for Occupational Safety and Health (NIOSH) was notified of this incident on March 7, 2001, by the United States Fire Administration. On May 15, 2001, a Safety and Occupational Health Specialist from NIOSH's Fire Fighter Fatality Investigation and Prevention Program investigated this incident. Meetings were conducted with the Chief of the department, an Investigator from



Photo courtesy of Victoria Naegele

Incident Site

The **Fire Fighter Fatality Investigation and Prevention Program** is conducted by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the program is to determine factors that cause or contribute to fire fighter deaths suffered in the line of duty. Identification of causal and contributing factors enable researchers and safety specialists to develop strategies for preventing future similar incidents. The program does not seek to determine fault or place blame on fire departments or individual fire fighters. To request additional copies of this report (specify the case number shown in the shield above), other fatality investigation reports, or further information, visit the Program Website at

www.cdc.gov/niosh/firehome.html
or call toll free 1-800-35-NIOSH



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the State Police Department, the municipality's administrative liaison, and the city's public health and safety representative. Interviews were conducted with the officers, fire fighters, and a power utility lineman involved in this incident. The NIOSH investigator reviewed the state police's copies of site maps, drawings, photos, witness statements, dispatch run sheets, accident report, the fire department's standard operating procedures, and the victim's training records. A site visit was conducted and the site was photographed.

The site of the incident is a gravel road measuring 28 feet in width with no shoulders. The incident site is 2.2 miles north of the intersection of a paved county road and 337 feet south of the driveway to the structure fire. The engine struck a tree (measuring 12 inches in diameter) located 12 feet from the edge of the road (See Diagram). The incident site has a posted speed limit of 50 mph. The engine involved in this incident is an 18 year-old Class-A pumper that measures 8 feet wide and 25 feet long. The engine has a square-shaped 1,000-gallon water tank, not equipped with baffles. The engine is equipped with air brakes. The gross vehicle weight is 27,500 lbs, and at the time of the incident, the water tank was full, which added 8,500 lbs to the total weight of the engine. An inspection of the engine was completed by the state police, and no mechanical problems were identified as a contributing factor to this incident. At the time of the incident, the weather was reported as being cloudy with a temperature of 34° F. The road was covered with a thin layer of ice on top of packed snow.

The fire department involved in this incident consists of 1 station with a total of 13 uniformed fire fighters. The department serves a population of 4,000 in a geographic area of 900 square miles. The victim had a basic and current Class D driver's license. The state does not require a commercial driver's license for persons operating emergency vehicles or

apparatus. The department does not have written qualifications to become a qualified driver, but they require drivers to demonstrate their driving skills to a department officer before being qualified to drive an apparatus. The victim met the fire department's requirements for operating fire department apparatus. The truck was equipped with lap belts; however, the victim and fire fighter were not wearing their lap belts. The department did have a standard operating procedure which required the use of seat belts. The department requires all new fire fighters to complete 52 hours of training in basic fire fighting. The victim was NFPA certified as Fire Fighter Level I with 22 years of fire fighting experience. The victim had received training in the following areas: apparatus/engine operator, hazardous materials, fire service instructor, wildland fire fighting, interagency helicopter (heliport manager for fire and rescue training from a helicopter), and ice rescue. The victim had 20 years of experience with this department, which included 4 years as an Assistant Chief.

INVESTIGATION

On March 6, 2001, at 1442 hours, a call came into Central Dispatch reporting a structure fire. At 1443 hours, Station 5, Station 6, and Station 7 were toned out. *Note: The victim and fire fighter were members of Station 5. Stations 5, 6, and 7 are automatic aid companies.* The victim and fire fighter responded in Engine 5 at 1445 hours. Both a fire fighter/emergency medical technician (EMT #1) and a fire fighter responded in their personally owned vehicles (POVs). Other apparatus responding to the structure fire were Tender 5 with a driver/operator (at 1450 hours), Tender 7 with a driver/operator (at 1453 hours), Engine 7 with a driver/operator (at 1453 hours), Engine 6 with a driver/operator and a fire fighter (at 1454 hours), and Tender 6 with a driver/operator (at 1457 hours). Additional fire fighters responded in their POVs. At 1501 hours, the fire fighter/emergency medical technician (EMT #1) and a fire fighter arrived on the scene of the structure fire



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in their POVs. The fire fighter assumed incident command (IC), conducted a size-up of the incident, and reported to Central Dispatch that they had a working garage fire. The IC then met with EMT #1 at the end of the driveway to the garage fire and instructed her to have the driver/operators back their apparatus down the driveway when they arrived on the scene. Engine 5, followed by Tender 7, the power company's service truck (a lineman [driver] followed the apparatuses to cut the electrical service drop to the structure); Engine 6, and Tender 6 were approaching the scene from the south. As Engine 5 approached a curve in the road, the victim slowed the apparatus down after seeing smoke to his left. *Note: The smoke was coming from a local trash site that was incinerating garbage at the time of the incident.* The victim proceeded through the curve toward the structure fire. *Note: The driver/operator of Tender 7, who was following Engine 5, reported to state police that he was operating Tender 7 at a speed of approximately 50 mph.* At 1503 hours, the fire fighter on Engine 5 radioed Central Dispatch reporting that they were arriving on the scene (see Photo 1). As the fire fighter completed his report of their arrival to Central Dispatch, the victim lost control of the engine. The engine fish-tailed and the victim tried to straighten out the direction of travel of the apparatus. The victim overcorrected, causing the rear wheels on the passenger's side of the vehicle to go off the road. The apparatus continued to travel into the southbound (left lane) before the victim overcorrected, causing the vehicle to travel back toward the northbound lane. The apparatus left the road, overturned onto the passenger's side, and struck a tree (see Diagram and Photo 1). The victim was thrown into the passenger's side, landing on top of the fire fighter. Tender 7 was just coming out of the curve when the driver/operator saw Engine 5 sliding and equipment falling off the apparatus. The IC and EMT #1 witnessed Engine 5 losing control before leaving the road and overturning. At 1504 hours, EMT #1

radioed Central Dispatch reporting that Engine 5 had overturned and that they needed extrication equipment. At 1504 hours, Rescue 20 was toned out for the overturned engine. The IC and EMT #1 ran to the overturned apparatus, and the driver/operator of Tender 7 slowed to see if they needed any assistance. They replied that they didn't need assistance at this time so the driver/operator of Tender 7 proceeded to the garage fire. *Note: The driver/operator of Tender 7 reported to the NIOSH investigator that he had not experienced any icy conditions on the road until he attempted to enter the driveway leading to the garage fire.* The power company lineman stopped to help the IC and EMT #1. Engine 6 and Tender 6 proceeded to the garage fire. The EMT told the lineman that they had two fire fighters trapped inside the cab of the Engine. She told him that one of the fire fighters was conscious (the passenger) and the other fire fighter (the victim) was unconscious. The windshield of the cab was partially knocked out by the impact with the tree. They attempted to pull the windshield out by hand but were unsuccessful. The lineman then pulled his truck to the south side of the incident scene and grabbed his chainsaw to cut the tree that Engine 5 had struck (the tree was still standing and was hindering their access to the cab). While cutting the tree, the lineman used the winch (20,000 lbs) on the front of his truck to pull the tree away from the apparatus. The windshield was removed from the apparatus by attaching the hook of the cable from the winch to the center of the cab's roof (see Photo 2). The victim was pulled from the cab, and EMT #1 began administering cardiopulmonary resuscitation (CPR). Medic 1 (EMT #2), who had responded at 1508 hours, arrived on the scene at 1525 hours. The two emergency medical technicians (EMT #1 and EMT #2) continued administering CPR on the victim for approximately 20 minutes before pronouncing the victim dead at the scene. The fire fighter was able to climb out of the cab and was provided medical attention before being transported



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in Medic 1 to the area hospital for further medical evaluation.

CAUSE OF DEATH

The death certificate lists the cause of death as multiple blunt force injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fire departments should ensure that all drivers of fire department vehicles are responsible for the safe and prudent operation of the vehicle under all conditions.¹

Discussion: Fire departments should ensure that drivers/operators of fire service vehicles are familiar with hazardous routes in their area (e.g., snow-/ice-packed gravel roads) and always maintain a safe speed. Additionally, drivers of large apparatus should use extreme caution when driving on ice- or snow-covered roads.

Recommendation #2: Fire departments should ensure that apparatus equipped with water tanks are provided with baffles to control the water's movement.²

Discussion: Apparatus equipped with water tanks should follow the provisions set forth in NFPA 1901, Standard on Automotive Fire Apparatus, Chapter 17. This standard states that all apparatus equipped with water tanks should be baffled or have swash partitions to form a containment to control water movement.

Recommendation #3: Fire departments should enforce standard operating procedures (SOPs) on the use of seat belts in all emergency vehicles.^{1,3}

Discussion: Fire departments should enforce SOPs on the use of seat belts as established by the department. The SOPs should apply to all persons riding in all emergency vehicles and should state that all persons be seated and secured in an approved riding position any time the vehicle is in motion. The department did have written SOPs on the use of seat belts.

REFERENCES

1. National Fire Protection Association [1997]. NFPA 1500, Standard on fire department occupational safety and health program. Quincy, MA: National Fire Protection Association.
2. National Fire Protection Association [1999]. NFPA 1901, Standard on automotive fire apparatus. Quincy, MA: National Fire Protection Association.
3. Cook JL Jr. [1998]. Standard operating procedures and guidelines. Saddle Brook, NJ: Penn Well.

INVESTIGATOR INFORMATION

This incident was investigated by Mark McFall, Safety and Occupational Health Specialist, Division of Safety Research, NIOSH.



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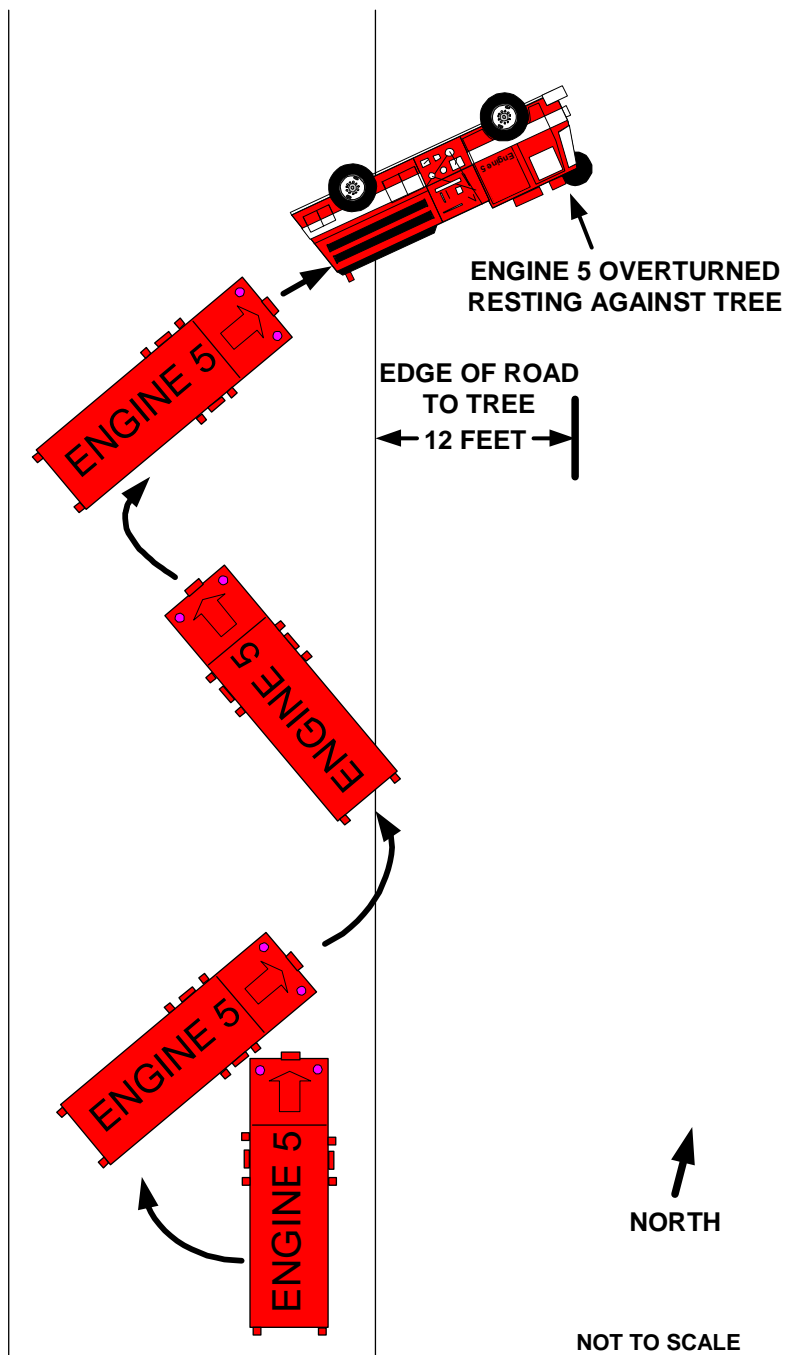


Diagram. Aerial View of Incident Site

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Photo 1. Incident Site

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Photo 2. Engine 5